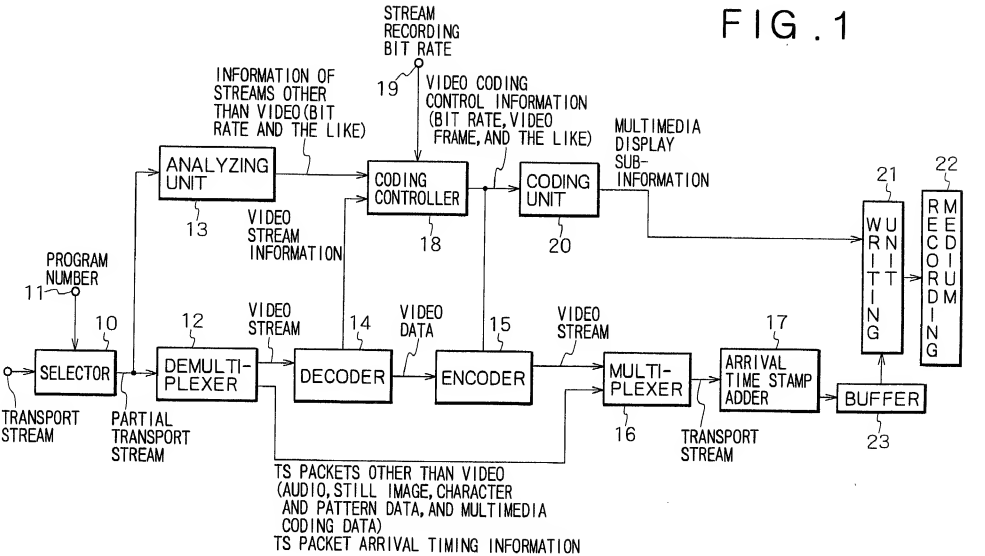
EP 0 950 1142 A2 2000 0880

FIG. 1



EP 1 089 580 A2

FIG. 2A

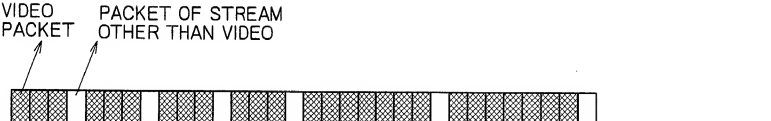


FIG. 2B

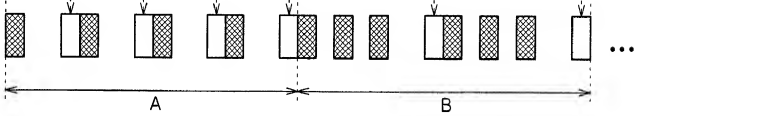


FIG. 3A

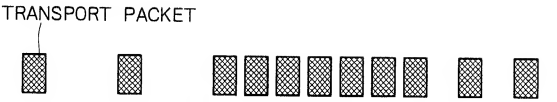


FIG. 3B

FIG. 3C

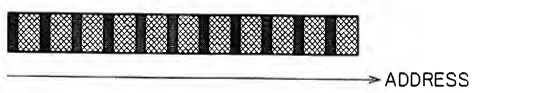


FIG. 4

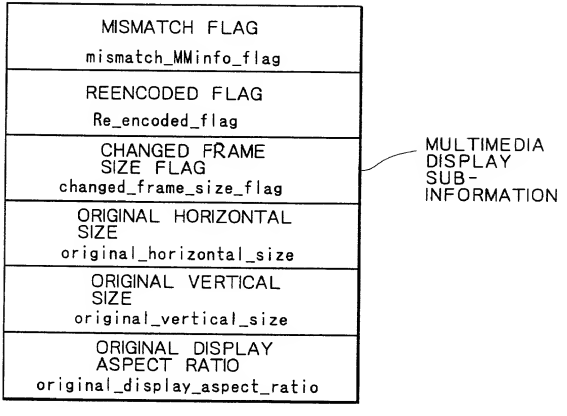

MISMATCH FLAG
mismatch_MMinfo_flag
REENCODED FLAG
Re_encoded_flag
CHANGED FRAME SIZE FLAG
changed_frame_size_flag
ORIGINAL HORIZONTAL SIZE
original_horizontal_size
ORIGINAL VERTICAL SIZE
original_vertical_size
ORIGINAL DISPLAY ASPECT RATIO
original_display_aspect_ratio
MULTIMEDIA DISPLAY SUB-INFORMATION

FIG. 5

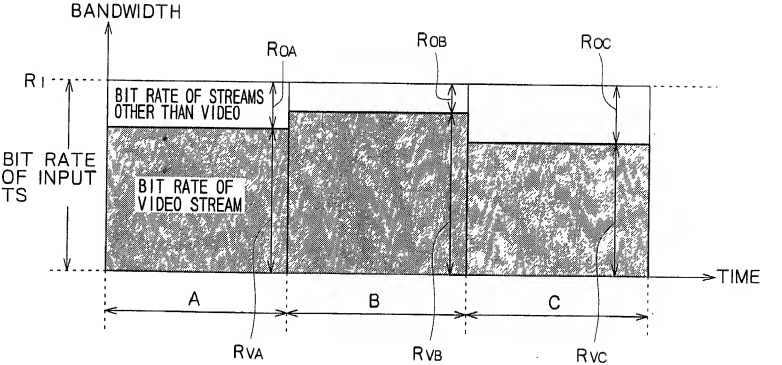

BANDWIDTH
ROA
ROB
ROC
RI
BIT RATE OF STREAMS OTHER THAN VIDEO
BIT RATE OF INPUT TS
BIT RATE OF VIDEO STREAM
TIME
A
B
C
RVA
RVB
RVC

FIG. 6

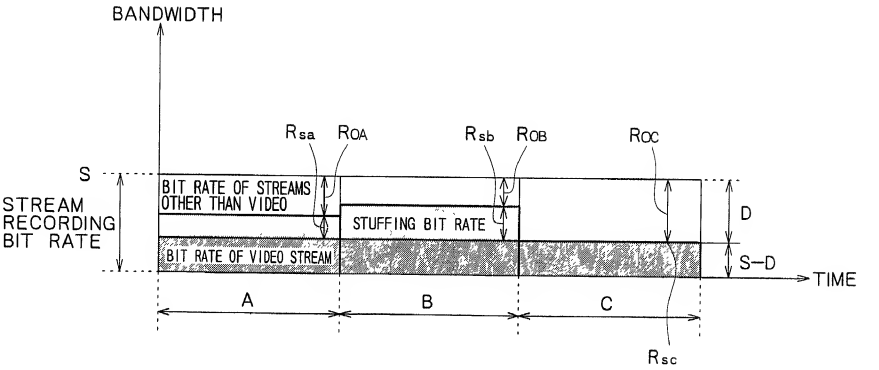

BANDWIDTH
Rsa
ROA
Rsb
ROB
ROC
S
STREAM RECORDING BIT RATE
BIT RATE OF STREAMS OTHER THAN VIDEO
STUFFING BIT RATE
BIT RATE OF VIDEO STREAM
D
S−D
TIME
A
B
C
Rsc

FIG. 7

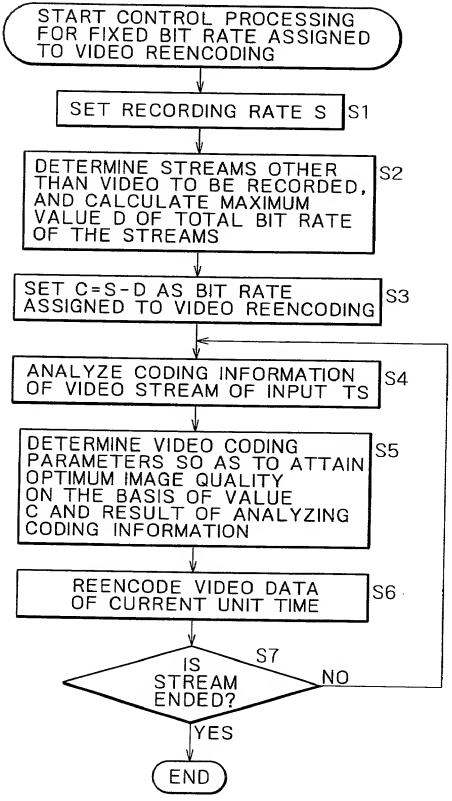

START CONTROL PROCESSING FOR FIXED BIT RATE ASSIGNED TO VIDEO REENCODING
SET RECORDING RATE S
S1
DETERMINE STREAMS OTHER THAN VIDEO TO BE RECORDED, AND CALCULATE MAXIMUM VALUE D OF TOTAL BIT RATE OF THE STREAMS
S2
SET C=S-D AS BIT RATE ASSIGNED TO VIDEO REENCODING
S3
ANALYZE CODING INFORMATION OF VIDEO STREAM OF INPUT TS
S4
DETERMINE VIDEO CODING PARAMETERS SO AS TO ATTAIN OPTIMUM IMAGE QUALITY ON THE BASIS OF VALUE C AND RESULT OF ANALYZING CODING INFORMATION
S5
REENCODE VIDEO DATA OF CURRENT UNIT TIME
S6
IS STREAM ENDED?
S7
NO
YES
END

FIG. 8

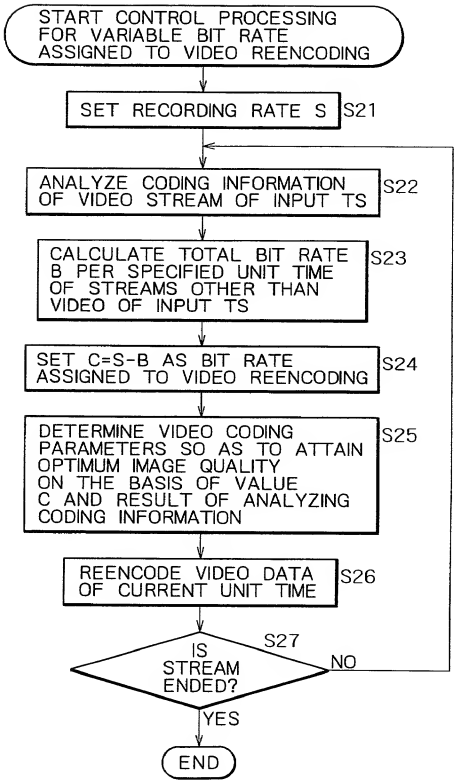

START CONTROL PROCESSING FOR VARIABLE BIT RATE ASSIGNED TO VIDEO REENCODING
SET RECORDING RATE S
S21
ANALYZE CODING INFORMATION OF VIDEO STREAM OF INPUT TS
S22
CALCULATE TOTAL BIT RATE B PER SPECIFIED UNIT TIME OF STREAMS OTHER THAN VIDEO OF INPUT TS
S23
SET C=S-B AS BIT RATE ASSIGNED TO VIDEO REENCODING
S24
DETERMINE VIDEO CODING PARAMETERS SO AS TO ATTAIN OPTIMUM IMAGE QUALITY ON THE BASIS OF VALUE C AND RESULT OF ANALYZING CODING INFORMATION
S25
REENCODE VIDEO DATA OF CURRENT UNIT TIME
S26
IS STREAM ENDED?
S27
NO
YES
END

FIG. 9

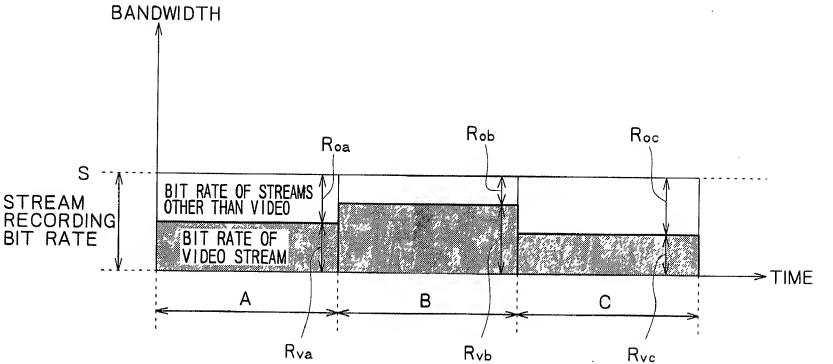

BANDWIDTH
Roa
Rob
Roc
S
STREAM RECORDING BIT RATE
BIT RATE OF STREAMS OTHER THAN VIDEO
BIT RATE OF VIDEO STREAM
TIME
A
B
C
Rva
Rvb
Rvc

FIG. 10

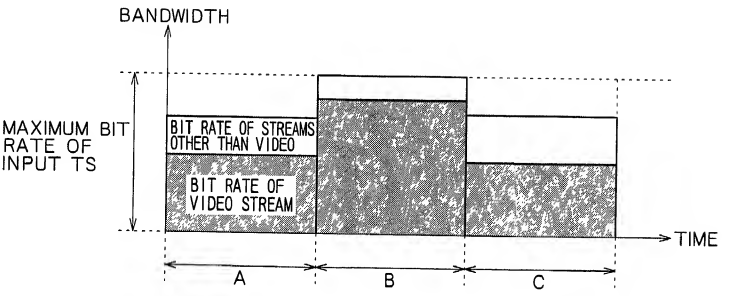

BANDWIDTH
MAXIMUM BIT RATE OF INPUT TS
BIT RATE OF STREAMS OTHER THAN VIDEO
BIT RATE OF VIDEO STREAM
TIME
A
B
C

FIG. 11

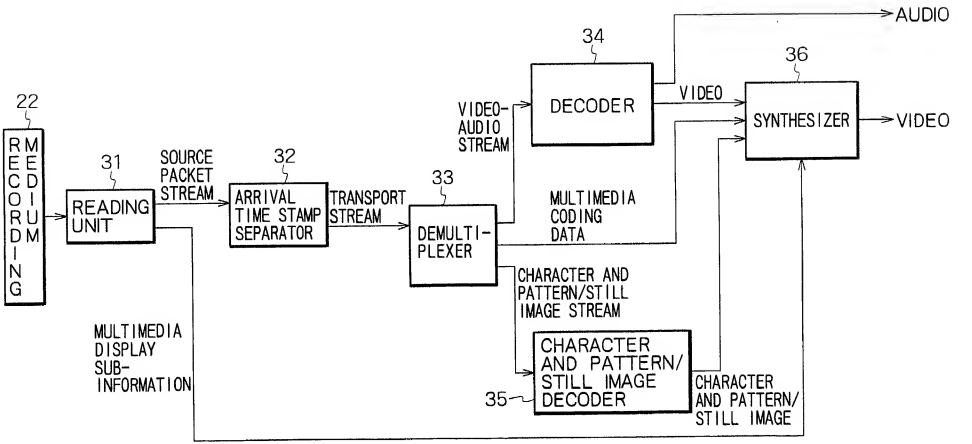
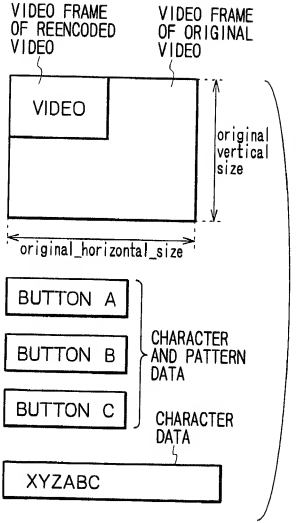

AUDIO
34
36
22
DECODER
VIDEO
SYNTHESIZER
VIDEO
VIDEO-
AUDIO
STREAM
RECORDING MEDIUM
31
SOURCE
PACKET
STREAM
32
33
READING
UNIT
ARRIVAL
TIME STAMP
SEPARATOR
TRANSPORT
STREAM
DEMULTI-
PLEXER
MULTIMEDIA
CODING
DATA
CHARACTER AND
PATTERN/STILL
IMAGE STREAM
MULTIMEDIA
DISPLAY
SUB-
INFORMATION
CHARACTER
AND PATTERN/
STILL IMAGE
DECODER
35
CHARACTER
AND PATTERN/
STILL IMAGE
30

FIG. 12A



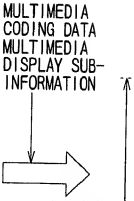
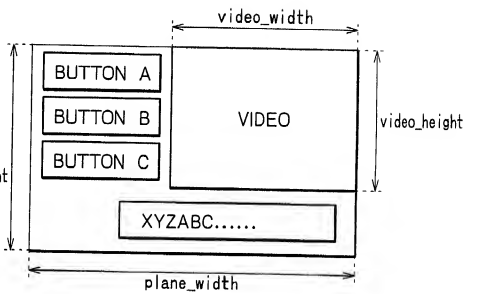


FIG. 12B



EP 0 838 960 A2

FIG. 13

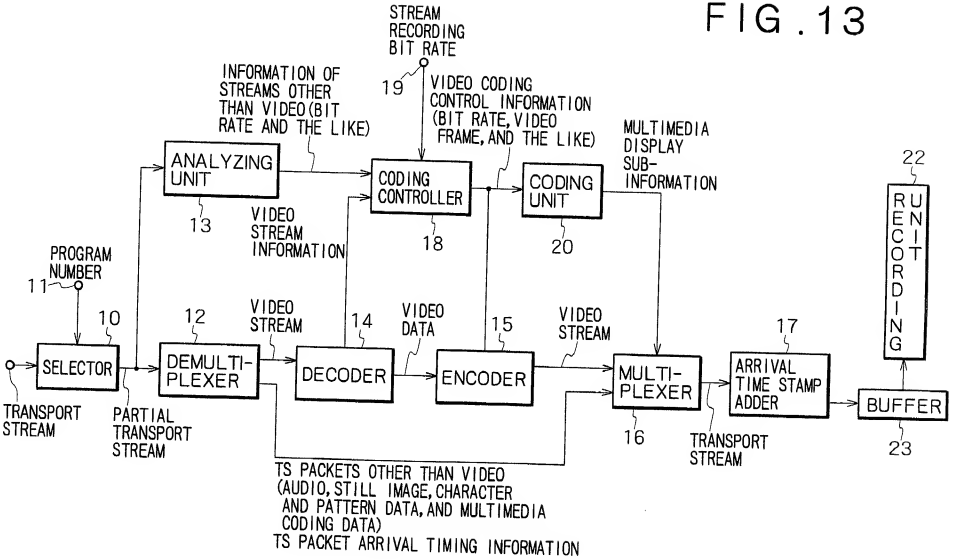
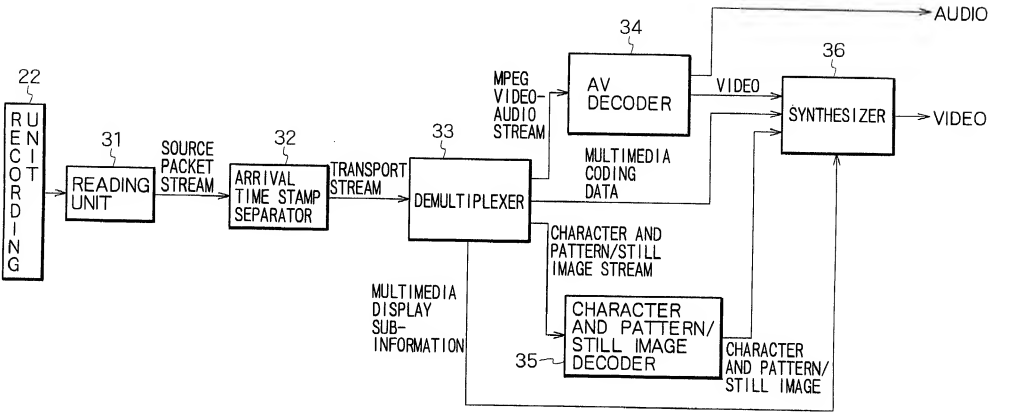
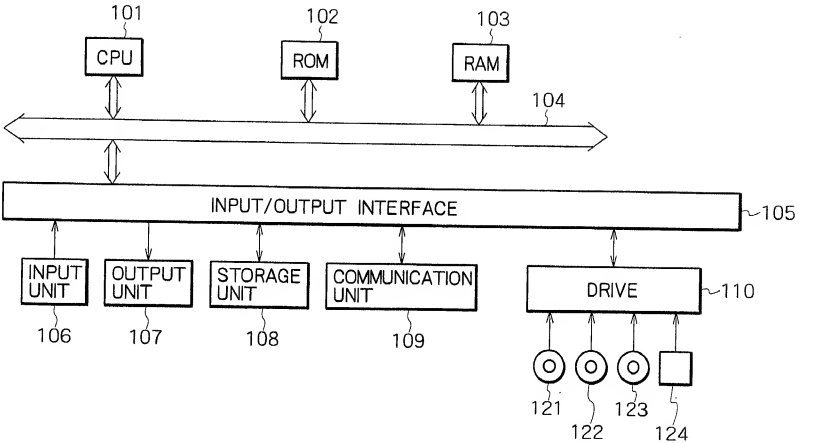


FIG. 14


22
RECORDING UNIT
31
READING UNIT
SOURCE PACKET STREAM
32
ARRIVAL TIME STAMP SEPARATOR
TRANSPORT STREAM
33
DEMULTIPLEXER
MPEG VIDEO-AUDIO STREAM
34
AV DECODER
AUDIO
VIDEO
36
SYNTHESIZER
VIDEO
MULTIMEDIA CODING DATA
CHARACTER AND PATTERN/STILL IMAGE STREAM
MULTIMEDIA DISPLAY SUB-INFORMATION
CHARACTER AND PATTERN/ STILL IMAGE DECODER
35
CHARACTER AND PATTERN/ STILL IMAGE

30

FIG. 15


101
CPU
102
ROM
103
RAM
104
INPUT/OUTPUT INTERFACE
105
INPUT UNIT
106
OUTPUT UNIT
107
STORAGE UNIT
108
COMMUNICATION UNIT
109
DRIVE
110
121
122
123
124